

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method of performing a resource action on a resource among a plurality of resources in a clustered computer system of the type including a plurality of cluster entities, the plurality of cluster entities including a plurality of nodes and a plurality of cluster objects resident on at least a portion of the plurality of nodes, wherein the plurality of nodes and the plurality of cluster objects are each capable of owning a resource, and wherein each of the plurality of resources is configured to be owned by at most one of the plurality of cluster entities at a time, the method comprising:

- (a) acquiring a lock on each active node among the plurality of nodes;
- (b) modifying a node configuration parameter for each active node among the plurality of nodes, such that any inactive node among the plurality of nodes is thereafter blocked from being accepted into the clustered computer system;
- (c) modifying an object configuration parameter on each active cluster object that could own the resource, such that any inactive cluster object that could own the resource is thereafter blocked from being accepted into the clustered computer system, and such that any inactive node is thereafter blocked from accepting an active cluster object;
- (d) performing the resource action on the resource after the lock is acquired and the node and object configuration parameters are modified, wherein performing the resource action changes the ownership of the resource; whereby any inactive node among the plurality nodes that is blocked from being accepted into the clustered computer system after modification of the node configuration parameter is blocked from causing a resource conflict resulting from the change in ownership of the resource; and

Page 2 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket ROC920010001US1
WH&E IBM/185
K:\ibm\185\Amendment and Response to 9-8-04 OA.wpd

(e) releasing the lock on each active node after performing the resource action.

2. (Original) The method of claim 1, further comprising determining that all cluster objects that could own the resource are active.

3. (Currently Amended) A method of performing a resource action in a clustered computer system of the type including a plurality of resources and a plurality of cluster entities configured to own the plurality of resources, wherein each of the plurality of resources is configured to be owned by at most one of the plurality of cluster entities at a time, the method comprising:

preparing the clustered computer system prior to performing the resource action by modifying at least one cluster configuration parameter associated with the plurality of cluster entities in the clustered computer system such that any cluster entity that is active during preparation of the clustered computer system accepts the modification to the cluster configuration parameter, and such that any cluster entity that is inactive during preparation of the clustered computer system does not accept the modification to the cluster configuration parameter; and

after preparing the clustered computer system, performing a resource action that changes the ownership of at least one of the plurality of resources;

whereby any such inactive cluster entity is thereafter blocked from being accepted into the clustered computer system and causing a resource conflict resulting from the change in ownership of the at least one of the plurality of resources.

4. (Original) The method of claim 3, wherein the plurality of cluster entities includes a plurality of cluster nodes.

Page 3 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket ROC920010001US1
WH&E IBM/185
K:\ibm\185\Amendment and Response to 9-8-04 OA.wpd

5. (Original) The method of claim 4, wherein the cluster configuration parameter includes a cluster identifier stored in each of the plurality of cluster nodes.

6. (Original) The method of claim 3, wherein the plurality of cluster entities includes a plurality of cluster objects.

7. (Original) The method of claim 6, wherein the cluster configuration parameter includes an object identifier and an ownership transfer count associated with each of the plurality of cluster objects.

8. (Canceled).

9. (Currently Amended) The method of claim 3, wherein performing the resource action comprises performing a resource recovery operation.

10. (Original) The method of claim 9, wherein the resource action comprises recovery of a resource selected from the group consisting of virtual address range, cluster object number, direct access storage device (DASD) number, and combinations thereof.

11. (Original) The method of claim 9, wherein the plurality of cluster entities comprises a plurality of nodes and a plurality of cluster objects resident on the plurality of nodes, and wherein performing the resource recovery action comprises:

(a) querying the plurality of nodes in the clustered computer system to determine which of a plurality of resources are owned; and

(b) transferring ownership of any unowned resources to a first node among the plurality of nodes.

Page 4 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket ROC920010001US1
WH&E IBM/185
K:\ibm\185\Amendment and Response to 9-8-04 OA.wpd

12. (Currently Amended) The method of claim 3, wherein preparing the clustered computer system includes obtaining a lock on the clustered computer system prior to modifying the cluster configuration parameter.

13. (Original) The method of claim 12, further comprising releasing the lock after performing the resource action.

14. (Original) The method of claim 3, wherein the cluster configuration parameter includes a value pair, and wherein modifying the cluster configuration parameter includes sequentially modifying each value in the value pair.

15. (Original) The method of claim 3, wherein preparing the clustered computer system includes starting a cluster protocol.

16. (Original) The method of claim 3, wherein preparing the clustered computer system includes detecting missing cluster entities capable of owning a resource to be acted upon by the resource action.

17. (Currently Amended) An apparatus, comprising:

- (a) a memory;
- (b) a plurality of resources;
- (c) a plurality of cluster entities resident in the memory and configured to own the plurality of resources, wherein each of the plurality of resources is configured to be owned by at most one of the plurality of cluster entities at a time; and
- (d) a program configured to perform a resource action on at least a subset of the plurality of resources in the clustered computer system that changes the

Page 5 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket ROC920010001US1
WH&E IBM/185
K:\bmr\185\Amendment and Response to 9-8-04 OA.wpd

ownership of at least one of the plurality of resources, and to prepare the clustered computer system prior to performing the resource action by modifying at least one cluster configuration parameter associated with the plurality of cluster entities in the clustered computer system such that any cluster entity that is active during preparation of the clustered computer system accepts the modification to the cluster configuration parameter, and such that any cluster entity that is inactive during preparation of the clustered computer system does not accept the modification to the cluster configuration parameter; whereby any such inactive cluster entity is thereafter blocked from being accepted into the clustered computer system and causing a resource conflict resulting from the change in ownership of the at least one of the plurality of resources.

18. (Original) The apparatus of claim 17, wherein the plurality of cluster entities includes a plurality of cluster nodes and a plurality of cluster objects.

19. (Original) The apparatus of claim 18, wherein the cluster configuration parameter includes a cluster identifier stored in each of the plurality of cluster nodes, and an object identifier and an ownership transfer count associated with each of the plurality of cluster objects.

20. (Currently Amended) The apparatus of claim 18, wherein the program is configured to perform the resource recovery action by querying the plurality of nodes in the clustered computer system to determine which of a plurality of resources are owned, and transferring ownership of any unowned resources to a first node among the plurality of nodes.

Page 6 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket ROC920010001US1
WH&E IBM/185
K:\ibm\185\Amendment and Response to 9-8-04 OA.wpd

21. (Original) The apparatus of claim 17, wherein the program is configured to perform the resource action by performing a resource recovery operation on a resource selected from the group consisting of virtual address range, cluster object number, direct access storage device (DASD) number, and combinations thereof.

22. (Original) The apparatus of claim 17, wherein the program is further configured to prepare the clustered computer system by obtaining a lock on the clustered computer system prior to modifying the cluster configuration parameter, and releasing the lock after performing the resource action.

23. (Original) The apparatus of claim 17, wherein the cluster configuration parameter includes a value pair, and wherein the program is configured to modify the cluster configuration parameter by sequentially modifying each value in the value pair.

24. (Original) The apparatus of claim 17, wherein the program is further configured to prepare the clustered computer system by starting a cluster protocol.

25. (Original) The apparatus of claim 17, wherein the program is further configured to prepare the clustered computer system by detecting missing cluster entities capable of owning a resource to be acted upon by the resource action.

26. (Currently Amended) A clustered computer system, comprising:

- (a) a plurality of nodes coupled to one another over a network;
- (b) a plurality of resources;
- (c) a plurality of cluster entities configured to own the plurality of

resources, wherein each of the plurality of resources is configured to be owned by at most one of the plurality of cluster entities at a time; and

Page 7 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket ROC920010001US1
WH&E IBM/185
K:\ibm\185\Amendment and Response to 9-8-04 OA.wpd

(d) a program resident on a first node among the plurality of nodes, the program configured to perform a resource action on at least a subset of the plurality of resources that changes the ownership of at least one of the plurality of resources, and to prepare the clustered computer system prior to performing the resource action by modifying at least one cluster configuration parameter associated with the plurality of cluster entities such that any cluster entity that is active during preparation of the clustered computer system accepts the modification to the cluster configuration parameter, and such that any cluster entity that is inactive during preparation of the clustered computer system does not accept the modification to the cluster configuration parameter; whereby any such inactive cluster entity is thereafter blocked from being accepted into the clustered computer system and causing a resource conflict resulting from the change in ownership of the at least one of the plurality of resources.

27. (Currently Amended) A program product, comprising:

(a) a program configured to perform a resource action in a clustered computer system of the type including a plurality of resources and a plurality of cluster entities configured to own the plurality of resources, wherein each of the plurality of resources is configured to be owned by at most one of the plurality of cluster entities at a time, wherein the program is configured to change the ownership of at least one of the plurality of resources when performing the resource action, and wherein the program is further configured to prepare the clustered computer system prior to performing the resource action by modifying at least one cluster configuration parameter associated with the plurality of cluster entities in the clustered computer system such that any cluster entity that is active during preparation of the clustered computer system accepts the modification to the cluster configuration parameter, and such that any cluster entity that is inactive

Page 8 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket ROC920010001US1
WH&E IBM/185
K:\ibm\185\Amendment and Response to 9-8-04 OA.wpd

during preparation of the clustered computer system does not accept the modification to the cluster configuration parameter; whereby any such inactive cluster entity is thereafter blocked from being accepted into the clustered computer system and causing a resource conflict resulting from the change in ownership of the at least one of the plurality of resources; and

(b) a signal bearing medium bearing the program.

28. (Original) The program product of claim 27, wherein the signal bearing medium includes at least one of a recordable medium and a transmission medium.

Page 9 of 15
Serial No. 09/845,592
Amendment and Response dated December 8, 2004
Reply to Office Action of September 8, 2004
IBM Docket: ROC920010001US1
WH&E IBM/185
K:\ibm\185\Amendment and Response to 9-8-04 OA.wpd